Abstract of the Disclosure

A time simulation technique for determining the service availability (or unavailability) of end-to-end network connections (or paths) between source and sink nodes is disclosed. The failure could be either a single failure mode or a multiple failure mode. The time simulation apparatus includes a network representation having pluralities of nodes, links and connections; each plurality having various attributes such as relating to failure, recovery and repair mechanisms. The apparatus further includes a mechanism for selecting one instance from each of the pluralities of nodes, links and connections based on the attributes; a failure/repair module for performing a simulated failure and repair on the selected instances as appropriate; a mechanism for selecting a connection between source and sink nodes; and an arithmetic mechanism for calculating availability of the selected connection.